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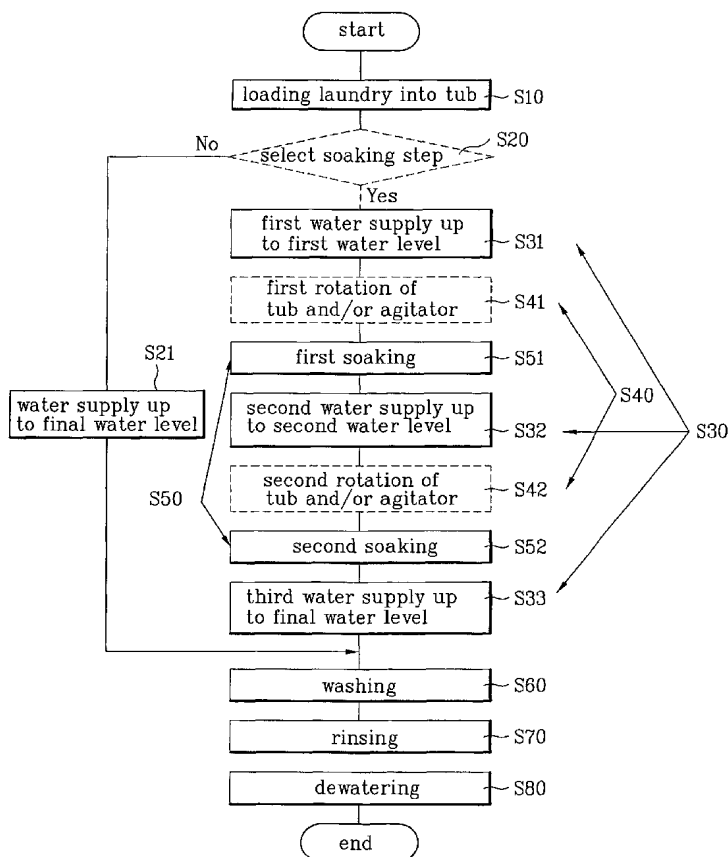
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(54) Title: WASHING METHOD OF WASHING MACHINE



(57) Abstract: Disclosed is a washing method a washing machine in which laundry is soaked effectively and conveniently. The washing method includes the steps of: loading laundry into a tub of the washing machine; supplying the tub with washing water such that water level increases step by step to a final level for a predetermined time period; repeatedly soaking the laundry for a predetermined time period within the washing water at the respective increased levels; and rotating the tub and a drum to wash the soaked laundry.



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WASHING METHOD OF WASHING MACHINE

This application claims the benefit of the Korean Application Nos. P2002-16112 filed on March 25, 2002 and
5 P2002-26890 filed on May 15, 2002, which are hereby incorporated by reference.

BACKGROUND OF THE INVENTION**Field of the Invention**

The present invention relates to a washing method of a washing machine, and more particularly, to a soaking step of the washing method.

Discussion of the Related Art

Generally, laundry is loaded in the tub of a washing machine along with detergent and is washed by mechanical friction due to the rotation of the tub and chemical reaction of the detergent. After such a washing step, if
20 necessary, the laundry may be rinsed, dewatered or dried.

Meanwhile, in case of seriously contaminated laundry, a soaking step may be carried out prior to performing the aforementioned washing steps. In the soaking step, washing water is supplied to the washing tub at an appropriate level
25 for the washing along with detergent. After that, the laundry is left as it is along with the detergent for a predetermined time. As a result, the laundry absorbs a sufficient amount of the washing water while the soaking step is carried out, and is also washed partially.

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However, since too much washing water is supplied once, it takes much time until the detergent is uniformly dissolved and diffused in the washing water during the soaking step. In other words, the detergent is incompletely dissolved during the soaking step and there exists a high possibility which the washing water has a nonuniform detergent concentration. Accordingly, the washing efficiency in the soaking step may be decreased relatively.

In addition, since the laundry is left for a comparatively long time period during the soaking step, the laundry may be again contaminated by contaminants which were separated, which acts as a factor decreasing the washing efficiency of the soaking step.

15

SUMMARY OF THE INVENTION

Accordingly, the present invention is directed to a washing method of a washing machine that substantially obviates one or more problems due to limitations and disadvantages of the related art.

20 An object of the present invention is to provide a washing method of a washing machine in which detergent is dissolved fast and uniformly while the soaking step is carried out.

Another object of the present invention is to provided a washing method of a washing machine in which it is prevented that laundry is again contaminated by a separated contaminant while the soaking step is carried out.

Additional advantages, objects, and features of the invention will be set forth in part in the description which follows and in part will become apparent to those having

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ordinary skill in the art upon examination of the following or may be learned from practice of the invention. The objectives and other advantages of the invention may be realized and attained by the structure particularly pointed
5 out in the written description and claims hereof as well as the appended drawings.

To achieve these objects and other advantages and in accordance with the purpose of the invention, as embodied and broadly described herein, a washing method of a washing
10 machine, includes the steps of: loading laundry into a tub of the washing machine; supplying the tub with washing water such that water level increases step by step to a final level for a predetermined time period; repeatedly soaking the laundry for a predetermined time period within the
15 washing water at the respective increased levels; and rotating the tub and a drum to wash the soaked laundry.

In more detail, the supplying step comprises a plurality of steps of respectively supplying the washing water at a plurality of different mid water levels obtained by dividing
20 the final level.

Also, the soaking step comprises a plurality of steps of respectively soaking the laundry in the washing water of corresponding mid water levels after the respective supplying steps. Preferably, the soaking step comprises a
25 step of stopping or discretely rotating the tub and/or an agitator.

Resultantly, the supplying step and the soaking step are carried out discretely at predetermined time intervals, or alternatively. Also, the soaking step is carried out

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between the supplying steps in which different water levels are formed.

In an aspect of the present invention, the aforementioned washing method may further include a step of rotating the tub and/or an agitator of the washing machine for a predetermined time period prior to performing the soaking step.

In this rotating step, it is preferable that the tub and/or the agitator have/has a rotational speed which gradually increases in the subsequent rotating steps. Also, it is desirable that the tub and/or the agitator have/has a rotational speed which gradually increases in one of the rotating steps. Alternatively, the tub or the agitator has a rotational speed lower than that of the washing step in the rotating steps.

In the meanwhile, the soaking step is preferably carried out selectively. For this purpose, the washing method of the invention further includes a step of determining whether or not to select the soaking step prior to the supplying step.

In case the washing method of the invention includes the selecting step of the soaking step, it is preferable that the soaking step is selected by once instruction being inputted to the washing machine. More preferably, the soaking step is selected by once pressing a corresponding button of a control panel of the washing machine.

When the soaking step is not selected, the washing method of the invention further includes a step of supplying the tub with the washing machine to the final level prior to the washing step.

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When the soaking step is selected, the washing method of the invention further includes a step of informing a user of the selection of the soaking step until the whole washing cycle is ended.

5 The informing step includes a step of turning on and off a specific LED of a control panel or a step of displaying a specific information on an LCD of a control panel.

By the aforementioned washing method of the invention, the detergent concentration of the washing machine is maintained at a high and uniform state and is finally optimized for the washing. Since laundry is soaked in such a uniform detergent concentration, the washing performance in the soaking step is enhanced and the soaking time period is shortened. Also, since the soaking step is completed within a short time period, the effect of the soaking itself is enhanced and the re-contamination of the laundry is prevented.

Meanwhile, since the soaking step can be easily selected and recognized, it provides a user with convenience.

20 It is to be understood that both the foregoing general description and the following detailed description of the present invention are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

25

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this application, illustrate embodiment(s) of the invention and together with

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the description serve to explain the principle of the invention. In the drawings:

FIG. 1 is a sectional view of a general washing machine;

5 FIG. 2 is a flow diagram illustrating a washing method of a washing machine according to the present invention;

FIG. 3 is a graph showing a variation of water levels depending on time in the soaking step according to the present invention; and

10 FIGS. 4A and 4B are schematic views of a control panel of a washing machine.

DETAILED DESCRIPTION OF THE INVENTION

Reference will now be made in detail to the preferred
15 embodiments of the present invention, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers will be used throughout the drawings to refer to the same or like parts.

In order to appreciate a washing method of the present
20 invention, a construction of a general washing machine will be first described. As well known, the washing machines are generally classified into a top loading type and a front loading type. In case of the top loading type washing machine, a tub stands upright and laundry is loaded into the
25 tub through an upside of the washing machine. Meanwhile, in case of the front loading type washing machine, a tub lies down and laundry is loaded into the tub through a front side of the washing machine. For the sake of simplicity in explanation, the top loading type washing machine will be
30 described as an example.

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FIG. 1 is a side sectional view of a general top loading type washing machine.

As shown, the washing machine includes a housing 10, an outer tub 20 and an inner tub 30, which are installed inside the housing 10.

The housing 10 is designed to install various elements therein and protects the elements. The housing 10 includes a door 12 installed in an upper portion, and the door 12 allows a user to load/unload laundry into/from an inside of the washing machine. Additionally, a control panel 100 for user's manipulation is installed in the housing 10.

The outer tub 20 is elastically fixed to an inside of the housing 10 through a damping member 11 and contains reserve washing water so as to constantly supply washing water to the inner tub 30 during a washing operation. In more detail, a penetration hole is formed in a bottom of the outer tub 20, and there is provided a driving shaft 30b connected to the inner tub 30 through the penetration hole.

The inner tub 30 is rotatably installed inside the outer tub 20. Additionally, the inner tub 30 includes a plurality of holes 30a so that washing water can be freely introduced from the outer tub 20. An agitator 31 has a plurality of blades and is rotatably installed in a bottom of the inner tub 30 so that it can be connected to the driving shaft 30b. Laundry is loaded into the inner tub 30 constructed as above and is washed due to rotations/ rotation of the inner tub 30 and/or the agitator 31. Meanwhile, a driving part 40 is located in a lower portion of the outer and inner tubs 20 and 30 and supplies a power for rotating the inner tub 30 and the agitator 31. Generally, the driving part 40

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includes a motor, a clutch, and the like. As described above, the driving part 40 is connected to the inner tub 30, the agitator 31 and the driving shaft 30b.

A washing method of the present invention will be described below with reference to the above washing machine and the related drawings. Except for an arrangement of the tubs, a basic structure of the front loading type washing machine is substantially equal to that of the top loading type washing machine. Accordingly, although the washing method of the present invention will be described with reference to the top loading type washing machine, the washing method is also applicable to the front loading type washing machine.

FIG. 2 is a flowchart showing the washing method of the present invention, and FIG. 3 is a graph showing a water level according to time period during a soaking operation.

First, a predetermined amount of laundry is loaded into the tub (e.g., the inner tub) 30 so as to wash the laundry in the washing machine (S10). Generally, the laundry consists of different kinds of fabrics, such as cotton and woolen fabrics. Also, contamination levels of individual laundries are different from each other. Detergent can be supplied into the tub 30 together with the laundries prior to a following water supply step S30 or simultaneously when the water supply step S30 starts.

If the user operates the washing machine after loading the laundries, a series of washing procedures start under a control of a controller provided in the washing machine. First, the washing machine starts to supply washing water into the tub 30 (S30). As shown in FIGs. 2 and 3, in the

water supply step S30, the washing water is supplied to increase the water level step by step and finally reaches a predetermined water level. In more detail, the water supply step S30 includes the water supply sub-steps S31 and S32 of supplying washing water up to a plurality of mid water level that are substantially different from each other. The mid water levels are obtained by properly dividing the final water level and have gradually increasing values. The times and values of the mid water levels can be fixed without regard to washing conditions or changed according to the washing conditions. Additionally, the final water level becomes a proper water level in a following washing step S60, and it is desired that the final water level be determined according to the washing conditions, such as an amount and a state of the laundries, a temperature of the washing water, and the like. The detergent supplied in the water supply step S30 is dissolved fully and uniformly.

Then, the laundries are soaked in the washing water at the respective water levels provided in the water supply step S30 (S50). In other words, the soaking step S50 includes the soaking sub-steps S51 and S52 of soaking the laundries in the washing water of the corresponding mid water levels provided in the water supply steps S31 and S32. As a result, the soaking step S50 is repeatedly performed for a predetermined time period in connection with the water supply step S30. During the soaking step S50, the laundries absorb the water and some contaminants are separated from the laundries. Additionally, the tub 30 and the agitator 31 are generally stopped during the soaking step S50. However, the tub 30 and the agitator 31 can be intermittently rotated

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so as to promote main function of the soaking step S50, i.e., the absorption of water and the separation of contaminants.

Meanwhile, it is preferable that the tub 30 and/or the agitator 31 are/is rotated for a predetermined time period prior to the soaking step S50 (S40). In more detail, the rotation sub-steps S41 and S42 are performed several times prior to the soaking sub-steps S51 and S52. Additionally, if necessary, the rotation sub-steps S51 and S52 can be selectively performed. Since a flow of the washing water is generated in the rotation step S40, the detergent can be dissolved more quickly and penetrated uniformly into the laundries. Some contaminants can be separated from the laundries due to the flow of the washing water. Further, since the separated contaminants also flow and float together with the flow of the washing water, the laundries are not re-contaminated with the separated contaminants. In more detail, since the rotation step S40 is a preliminary step for the washing step S60 using the rotations of the tub and the agitator, the tub 30 and/or the agitator 31 should be rotated at a lower speed than the washing step S60. Additionally, since an amount of separated contaminant increases with the passage of time, more flow of the washing water is needed so as to properly flow and float the increased amount of the contaminant. Accordingly, in order to prevent the laundries from being re-contaminated with the increased contaminants, it is desired that the tub 30 and the agitator 31 be rotated at a gradually increasing speed in the following rotation sub-steps. Further, with the passage of time, the tub 30 and the agitator 31 can be rotated faster and faster even in one rotation step.

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Considering the above rough description, it can be known that the soaking and rotation steps S40 and S50 are influenced by the attributes of the water supply step S30, i.e., the times of the water supply steps, the values of the mid water levels and the time required for the respective water supply steps. As described above, in addition to the values of the mid water levels obtained by dividing the final water level, the time required for the water supply sub-steps can be randomly changed since the final water level is changed according to the washing conditions. Accordingly, when determining all attributes (the times, the required time, the number of rotations) of the soaking and rotation steps S40 and S50, the times of the water supply steps can be a quantitative and objective factor. Meanwhile, although many times of the water supply step S30 is advantageous to the dissolution of the detergent, it causes the increase of an entire washing time. Accordingly, although the washing method of the present invention can include several times of the water supply steps S30, it is desired that the water supply step S30 be three times in an actual embodiments. In order for further appreciation, preferred embodiments of the present invention will be described below in detail.

Referring again to FIGs. 2 and 3, after the loading step S10, the washing water is supplied into the tub 30 up to a predetermined first water level (S31). As described above, the first water level is one of the mid water levels. Although the first water level is lower than the final water level, it is set to a proper water level enough to soak the laundries and dissolve the detergent. The detergent can be

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supplied into the tub 30 prior to the first water supply step S31 or together with the washing water during the first water supply step S31. The detergent can be dissolved rapidly and dispersed uniformly in the relatively
5 low first water level of the washing water (i.e., a small amount of washing water). Accordingly, in the first water supply step S31, the water level has a high and uniform concentration of the detergent so that a substantially improved washing performance is achieved.

10 After the first water supply step S31, preferably, the tub 30 and/or the agitator 31 are/is first rotated for a predetermined time period (S41). Although the washing method of the present invention can omit the first rotation step S41, it is advantageous since the detergent can be
15 dissolved more rapidly and penetrated uniformly into the laundries. Additionally, in the rotation step S41, some contaminants are separated from the laundries and the separated contaminants are floated, thereby preventing the re-contamination of the laundries. Although only one of the
20 tub 30 and the agitator 31 can be rotated in the first rotation step S41, it is desired to rotate both of them.

After the first rotation step S41, the laundries are first soaked in the washing water for a predetermined time period (S51). The laundries are kept in the washing water
25 of the first water level during the first soaking step S51. Due to the first soaking step S51, the laundries absorb water enough to completely separate the contaminants in the main washing step S60 and are partially washed (in other words, the contaminants are partially separated).
30 Particularly, since the washing water contains the high-

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concentration detergent through the precedent steps S31 and S41, more contaminants can be separated from the laundries within a short time. Additionally, during the first soaking step S51, the tub 30 and/or the agitator 31 can be
5 intermittently rotated to generate a flow of the washing water so as to prevent the re-contamination of the laundries and obtain an additional dissolution/diffusion of the detergent. Further, the rotations of the tub 30 and/or the agitator 31 assist the laundries to be partially washed and
10 to absorb the washing water during the soaking step S51.

After predetermined time passes, the washing water is supplied into the tub 30 up to the second water level (S32). In other words, the washing water is additionally supplied up to the second water level that is higher than the first
15 water level. During the second water supply step S32, the detergent remaining in the washing water of the first water level starts to be additionally dissolved, in which the detergent is almost saturated in the washing water of the first water level. The additionally dissolved detergent is
20 diffused rapidly and uniformly in the washing water of the second water level, such that the washing water has a high and uniform concentration of the detergent. Accordingly, the washing water is kept on the improved washing capacity, and all detergent first supplied is dissolved almost
25 completely in the washing water of the second water level.

After the second water supply step S31, preferably, the tub 30 and/or the agitator 31 are/is rotated in a second time for a predetermined time period prior to the soaking step (S42). During the second rotation step S42, the tub 30
30 and/or the agitator 31 are/is rotated to promote the

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complete dissolution of the detergent and assist the uniform diffusion of the dissolved detergent. Additionally, like the first rotation step S41, the laundries are preliminarily washed and prevented from being re-contaminated. Meanwhile, through the precedent steps S31, S41, S51 and S32, a large amount of separated contaminant already exists in the washing water and thus the re-contamination possibility of the laundry can be re-contaminated is increased. Accordingly, in order to effectively float the increased contaminants, it is desired that the tub 30 and/or the agitator be rotated at higher speed than the first rotation step S41. For the same reason, during the rotation steps S41 and S42, it is desired that the tub 30 and/or the agitator 31 be rotated faster and faster with the passage of time. Meanwhile, since the rotation steps S40 are preliminary steps, the tub 30 and/or the agitator 31 are not needed to rotate at higher speed than the main washing step S60.

After the second rotation step S42, the laundries are soaked in the washing water of the second water level for a predetermined time period (S52). During the second soaking step S52, many contaminants are additionally separated in the washing water of the second water level containing a high-concentration detergent. The tub 30 and/or the agitator 31 can be intermittently rotated so as to assist the second soaking step S52.

After a predetermined time passes, the washing water is supplied to the tub 30 from the second water level to the final water level (S53). In other words, the washing water has a water level higher than the second water level and is

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additionally supplied up to the final water level suitable for the main washing step S30. The washing water of the second water level in which the detergent is saturated is slightly diluted due to the third water supply step S32, but
5 has an optimal concentration of the detergent suitable for the main washing step S60. Additionally, in many cases, the detergent is completely dissolved through the precedent steps S31 to S52, but in some cases, some detergent may be remained. In that case, the remaining detergent can be
10 completely dissolved in the added washing water.

As described above, according to the washing method of the present invention, the water supply steps S31 and S32 are performed intermittently so as to have a gradually increasing water level at predetermined time intervals.
15 That is well shown in FIG. 3 as well as FIG. 2, in which FIG. 3 is a graph showing the water levels with respect to the time periods. Accordingly, the washing water contains the high and uniform concentration of the detergent so that an improved washing performance can be obtained at the
20 increased water levels. The detergent is almost completely dissolved in the washing water by repeating the water supply steps, and finally the washing water is optimized for the washing operation. Additionally, as shown in FIG. 3, the soaking steps S51 and S52 are also performed intermittently
25 at predetermined time intervals. In more detail, the soaking steps S51 and S52 are performed after the water supply steps S31 and S32. In other words, the water supply steps S31 to S33 and the soaking steps S51 and S52 are performed alternately, and the soaking steps S51 and S52 are
30 performed substantially between the water supply steps S31

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to S33. Accordingly, during the soaking steps S51 and S52, many contaminants are rapidly separated from the laundries under the high and uniform concentration of the detergent, which is formed in the water supply step. By repeatedly
5 performing the soaking steps S51 and S52 within a relatively short time, the absorption of the washing water and the separation of the contaminants are more effectively achieved and the possibility of the re-contamination is reduced.

After completing a series of the steps S30, S40 and S50,
10 the soaked laundries are washed (S60). The laundries are washed due to chemical reaction of the detergent as well as the rotations of the tub 30 and the agitator 31 during the washing step S60. Since the laundries are sufficiently soaked during the soaking step S50, the remaining
15 contaminants are easily and completely separated from the laundries.

After the washing step S60, if necessary, the laundries can be rinsed (S70) and/or dewatered (S80). In the rinse step S70, first, clean washing water is supplied into the
20 tub 30 and the laundries are washed with the clean washing water so as to remove the remaining detergent and contaminants of the laundries. Further, in the drying steps (S80), all washing water contained in the tub 30 is discharged and then the tub 30 is rotated at high speed so
25 as to remove water from the laundries.

In the meanwhile, the aforementioned soaking step (S50) is for effectively washing the laundry seriously contaminated, it is unnecessary for a general laundry. If the soaking step is applied to the general laundry, an
30 increase of the washing time period is caused. Accordingly,

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it is preferable that the soaking step (S50) is selectively performed. For selective soaking, the washing method of the invention, in a substantial embodiment, further includes a step of determining whether or not to select the
5 soaking prior to the washing water supplying step (S31).

In more detail, the user selects a washing mode that does not include at least the soaking step or selects a washing mode that includes the soaking step. Here, when the former is defined as a first washing mode, the first washing
10 mode includes only the washing step (S60), or may selectively include the rinsing step (S70) and/or the dewatering step (S80) along the washing step (S60) according to the washing condition. Also, when the latter is defined as a second washing mode, the second washing mode includes
15 at least the soaking (S50) and the washing step (S60), and may selectively include the rinsing step (S70) and/or the dewatering step (S80) along the washing step (S60) according to the washing condition like the first washing mode.

In the foregoing determining step (S20), since the
20 second washing mode is for specific laundry (i.e., seriously contaminated laundry), for the user's convenience, the first washing mode is basically set while the washing machine operates. Meanwhile, it is preferable that the second washing mode is easily selected by once instruction being
25 inputted to the washing machine. In other words, for the user's convenience, it is desirable that the soaking step (S50) is included in the whole washing cycle by once instruction being inputted to the washing machine. As
aforementioned, when inputting an instruction for an
30 intended operation, the user uses the control panel 100. As

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shown in FIGs. 4A and 4B, the control panel 100 has a window 110 for displaying operation status and a plurality of buttons 120 for operation instruction. For example, the window 110, as shown in FIG. 4A, is comprised of a plurality of light emitting diodes (LEDs) or as shown in FIG. 4B, is comprised of a liquid crystal display (LCD) for displaying the operation status as characters. Also, the buttons 120, for instance, includes a first button 121 for selecting temperature of washing water, a second button 122 for selecting water level of washing water, a third button 123 for selecting washing modes, and a fourth button 124 for operating or stopping the washing machine. User presses the buttons 120 to generate electrical signals for operation control, and a controller operates the washing machine to perform specific functions according to the generated electrical signals. The information related with the operation is provided to the user through the window 110. Accordingly, in the embodiments of the invention, the user can press a corresponding button of the control panel 100, i.e., the third button 123 to select the second mode, so that the soaking step (S50) is included in the whole washing cycle. The mode selection described as above can be performed by once button manipulation to thereby provide the user with a convenience.

25 If the soaking step (S50) is not selected, the washing machine operates under the first washing mode. Accordingly, the washing water is directly supplied to the tub 30 to the final level suitable for the washing so that the main washing step (S60) can be performed (S21).

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In the meanwhile, in case the soaking step (S50) is selected, the washing machine performs the at least aforementioned steps of S30, S40 and S50 along with the main washing step (S60). Here, for the use's convenience, it is desirable to inform the user of the selection of the soaking step (S50) or the second washing mode. As aforementioned, the user is informed of such a selection through the window 110 of the control panel 100. In more detail, as shown in FIG. 4A, a specific LED 110a corresponding to the soaking step (S50) may be turned on. Also, as shown in FIG. 4B, the user may be informed of the selection of the soaking step (S50) through the LCD as characters information. Accordingly, the user can recognize with ease that the soaking step (S50) is selected and carried out.

Effects of the washing method according to the invention will be summarized as follows.

Since washing water is supplied to the tub step by step, it has a high and uniform detergent concentration at a corresponding water level. Also, since the washing water supplying steps are repeated along with the rotation of the tub and/or the agitator, the detergent is dissolved completely and finally has an optimized detergent concentration for the washing. Further, since the soaking is also performed in a high detergent concentration in relation with the washing water supplying step, contaminants are fast separated from the laundry. Accordingly, the washing performance in the soaking step, so that the time period of the soaking step can be shortened.

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In addition, as aforementioned, since the soaking step itself is also performed step by step during a short time period, the absorption of washing water and the separation of contaminants are effectively performed and the re-
5 contamination possibility of the laundry decreases.

Meanwhile, the soaking step is selected with ease by once manipulation of the control panel and the user continues to be informed of the selection and performance of the soaking step through the control panel. Accordingly, it
10 becomes convenient substantially that the user uses the soaking step.

It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention. Thus, it is intended that the present
15 invention covers the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

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What is claimed is:

1. A washing method of a washing machine,
comprising the steps of:

loading laundry into a tub of the washing machine;

5 supplying the tub with washing water such that water
level increases step by step to a final level for a
predetermined time period;

repeatedly soaking the laundry for a predetermined
time period within the washing water at the respective
10 increased levels; and

rotating the tub and a drum to wash the soaked laundry.

2. The washing method of claim 1, wherein the
supplying step and the soaking step are carried out
15 discretely at predetermined time intervals.

3. The washing method of claim 1, wherein the
supplying step and the soaking step are carried out
alternatively.

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4. The washing method of claim 3, wherein the soaking
step is carried out between the supplying steps in which
different water levels are formed.

25 5. The washing method of claim 1, wherein the
supplying step comprises a plurality of steps of
respectively supplying the washing water at a plurality of
different mid water levels obtained by dividing the final
level.

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6. The washing method of claim 1, wherein the soaking step comprises a plurality of steps of respectively soaking the laundry in the washing water of corresponding mid water levels after the respective supplying steps.

5

7. The washing method of claim 1, wherein the soaking step comprises a step of stopping or discretely rotating the tub and/or an agitator.

10

8. The washing method of claim 1, further comprising a step of rotating the tub and/or an agitator of the washing machine for a predetermined time period prior to performing the soaking step.

15

9. The washing method of claim 8, wherein the tub and/or the agitator have/has a rotational speed which gradually increases in the subsequent rotating steps.

20

10. The washing method of claim 8, wherein the tub and/or the agitator have/has a rotational speed which gradually increases in one of the rotating steps.

25

11. The washing method of claim 8, wherein the tub or the agitator has a rotational speed lower than that of the washing step in the rotating steps.

12. The washing method of claim 1, wherein the final level is a level suitable for the washing.

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13. The washing method of claim 1 or 5, wherein the supplying step is performed three times.

14. The washing method of claim 13, wherein the
5 supplying step comprises the steps of:

first supplying the tub with the washing water to a first level;

after an elapse of a predetermined time, secondly
supplying the tub with the washing water to a second level
10 higher than the first level; and

thirdly supplying the tub with the washing water to the final level from the second level.

15. The washing method of claim 14, wherein the
15 detergent is supplied during the first supplying step or prior to the second supplying step.

16. The washing method of claim 14, wherein the soaking step comprises the steps of:

20 first soaking the laundry in the washing water having the first level for a predetermined time period between the first supplying step and the second supplying step; and

secondly soaking the laundry in the washing water having the second level for a predetermined time period
25 between the second supplying step and the third supplying step.

17. The washing method of claim 16, further comprising steps of: first rotating the tub and/or an agitator for a
30 predetermined time period prior to the first soaking step;

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and secondly rotating the tub and/or the agitator for a predetermined time period prior to the second soaking step.

18. The washing method of claim 17, wherein the tub
5 and/or the agitator have/has a rotational speed higher in the first rotating step than that in the second rotating step.

19. The washing method of claim 17, wherein the tub
10 and/or the agitator have/has a rotational speed which gradually increases depending on an elapse of time in the first and second rotating steps.

20. The washing method of claim 17, wherein the tub
15 and/or the agitator have/has a rotational speed lower in the first and second rotating steps than that in the washing step.

21. The washing method of claim 16, wherein during the
20 first and second soaking steps, the tub/drum or the agitator is stopped or rotates discretely.

22. The washing method of claim 1, wherein the soaking
step is carried out selectively.
25

23. The washing method of claim 22, wherein the soaking step is selected by once instruction being inputted to the washing machine.

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24. The washing method of claim 23, wherein the soaking step is selected by once pressing a corresponding button of a control panel of the washing machine.

5 25. The washing method of claim 22, further comprising a step of, when the soaking step is not selected, supplying the tub with the washing machine to the final level prior to the washing step.

10 26. The washing method of claim 1, further comprising a step of determining whether or not to select the soaking step prior to the supplying step.

15 27. The washing method of claim 26, wherein the determining step comprising steps of:

 selecting a first washing mode that does not include the soaking step; and

 selecting a second washing mode including at least the soaking step.

20

 28. The washing method of claim 27, wherein the first washing mode is an initial set mode.

25 29. The washing method of claim 27, wherein the second washing mode is selected by once pressing a corresponding button of a control panel.

30 30. The washing method of claim 27, further comprising a step of, when the first washing mode is selected, supplying the tub with the washing water to the final level

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prior to the washing step.

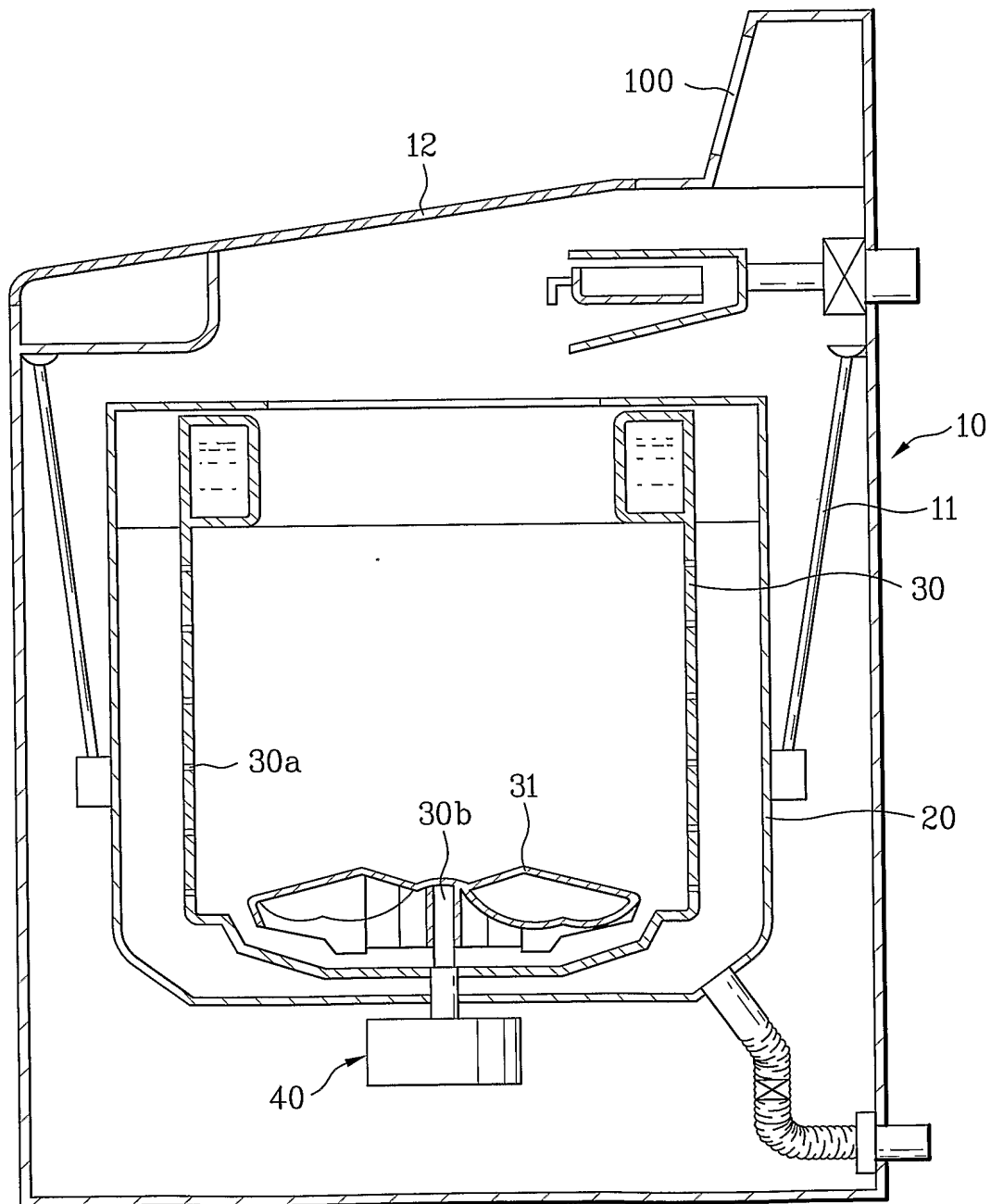
31. The washing method of claim 22, further comprising
a step of, when the soaking step is selected, informing a
5 user of the selection of the soaking step until the whole
washing cycle is ended.

32. The washing method of claim 31, wherein the
informing step comprises a step of turning on and off a
10 specific LED of a control panel.

33. The washing method of claim 31, wherein the
informing step comprises a step of displaying a specific
information on an LCD of a control panel.

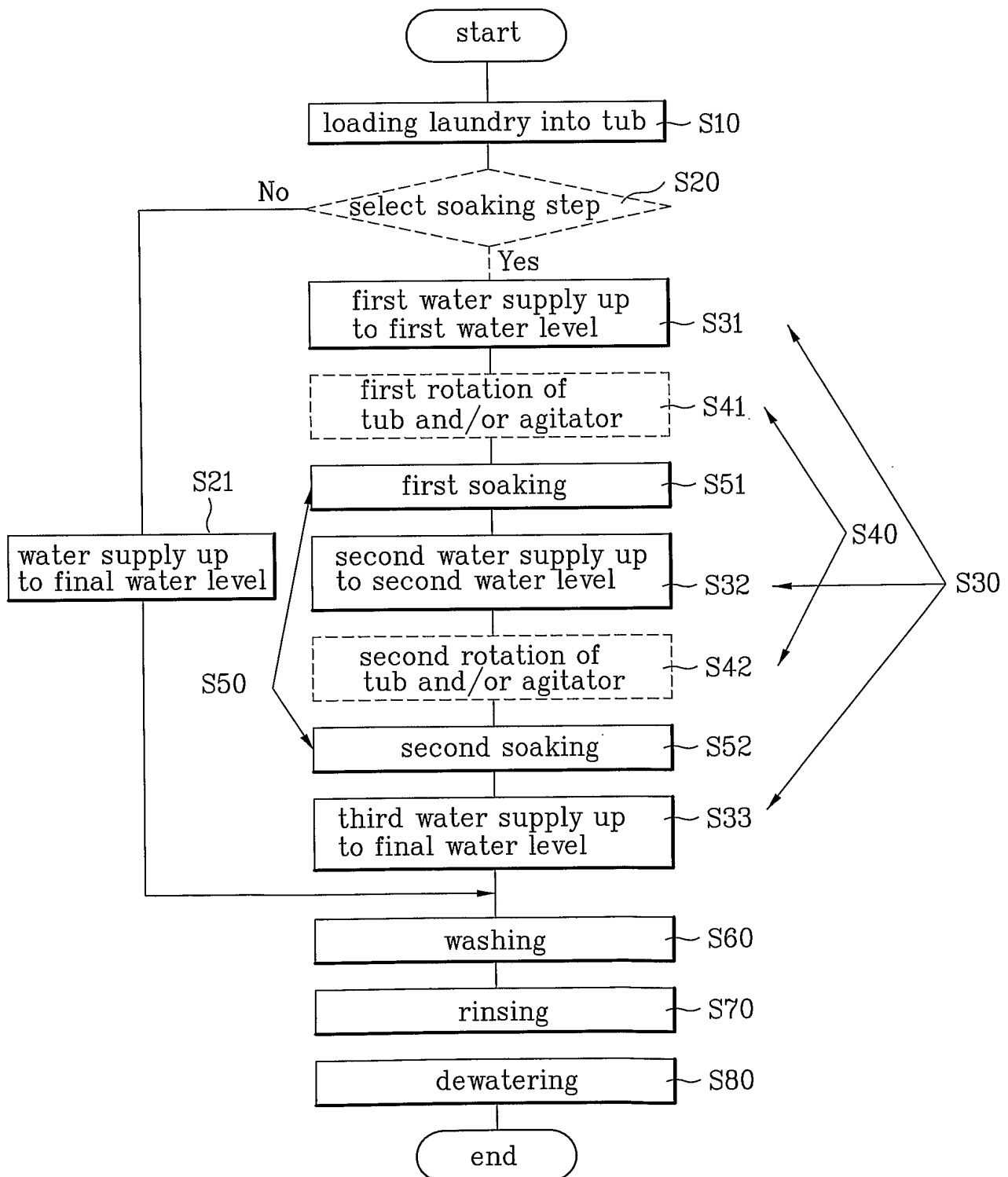
1/4

FIG. 1



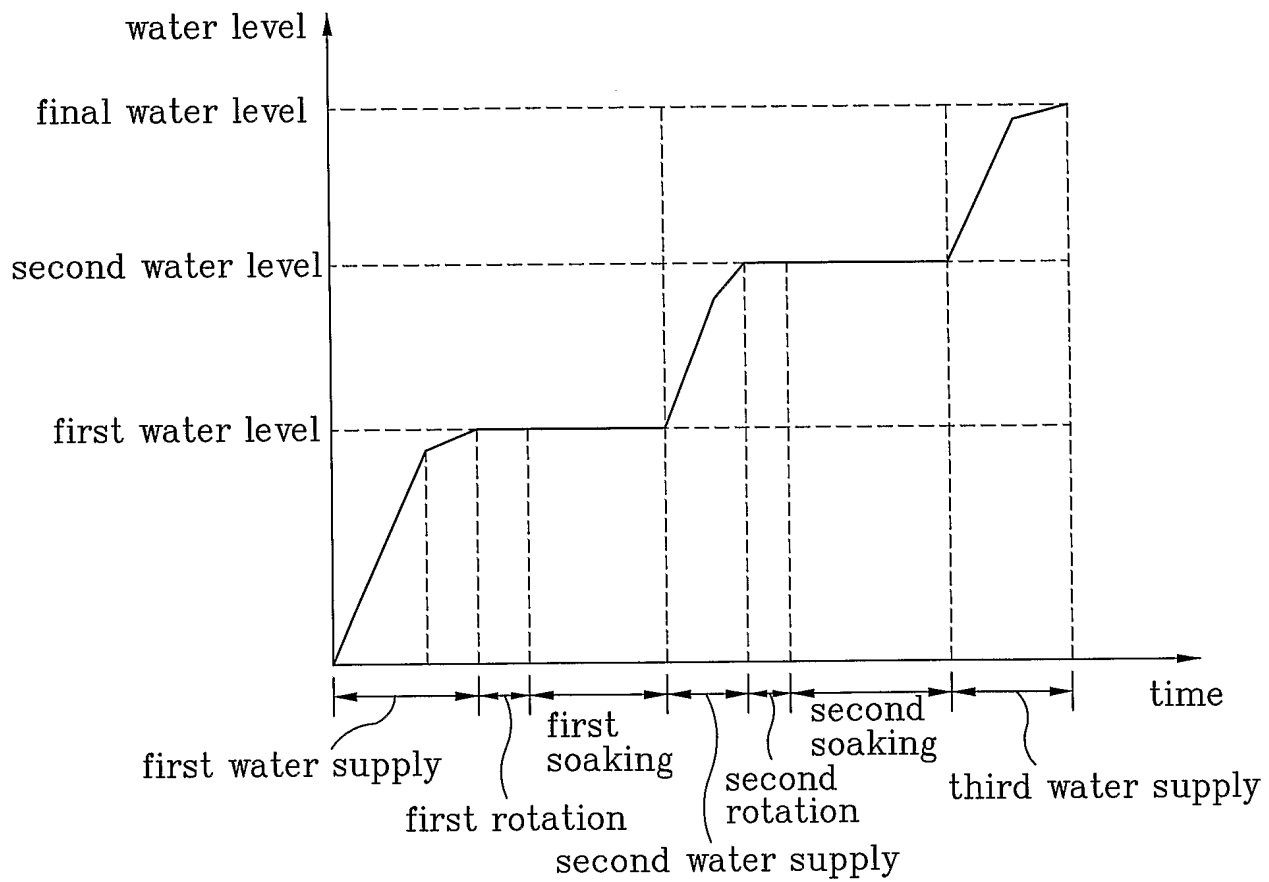
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FIG. 2



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FIG. 3



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FIG. 4A

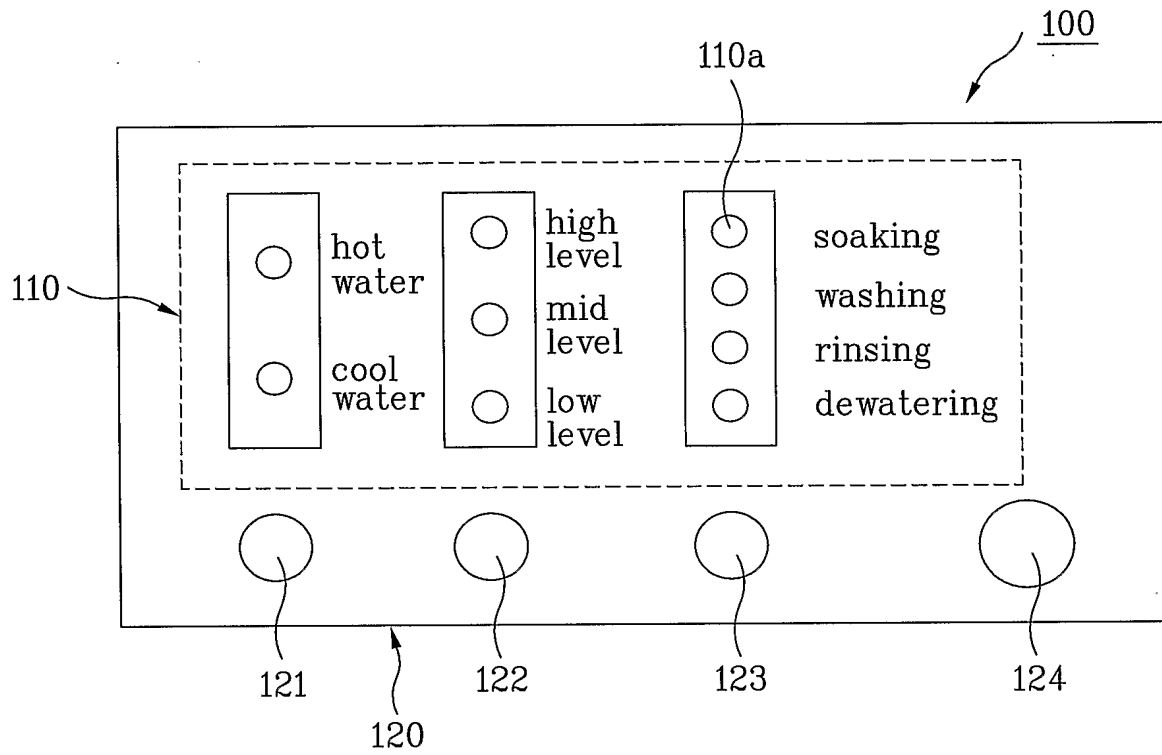
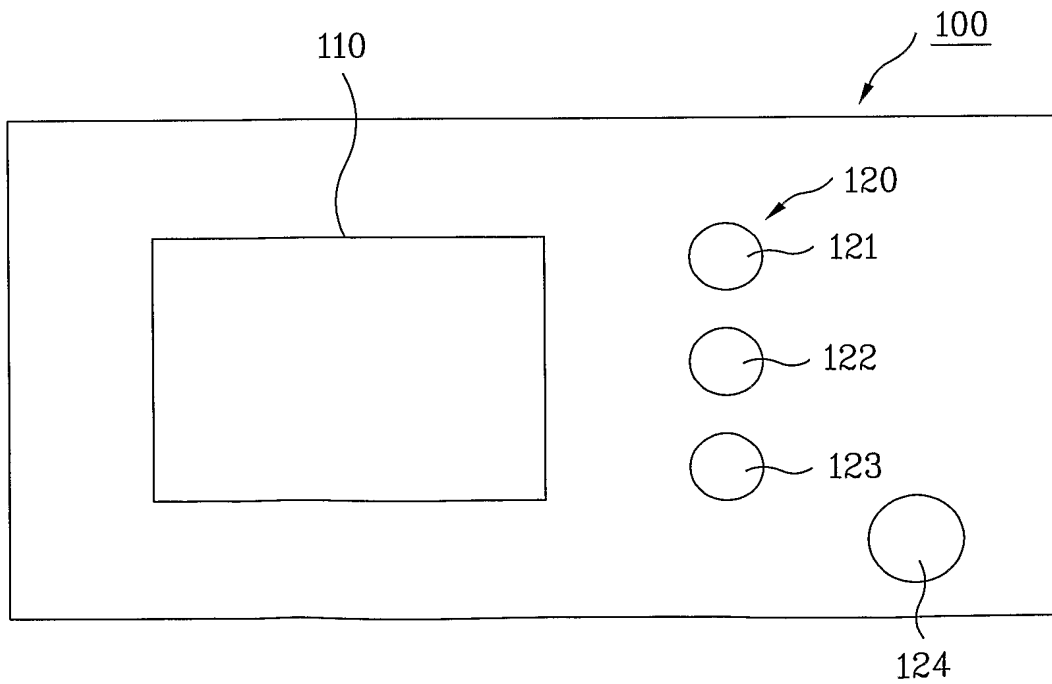


FIG. 4B



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR 03/00587-0

CLASSIFICATION OF SUBJECT MATTER

IPC⁷: D06F 33/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC⁷: D06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 10 099586 A (SHARP) 21 April 1998 (21.04.98) <i>WPI - Abstract; PAJ - Solution.</i>	1-3
A	<i>fig. 1-3,5.</i>	4-33
A	JP 03 141994 A (MATSUSHITA) 17 June 1991 (17.06.91) <i>fig. 1; PAJ - Solution.</i>	1-33
A	JP 02 102694 A (TOSHIBA) 16 April 1990 (16.04.90) <i>fig. 4,5; WPI - Abstract.</i>	1-33

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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20 May 2003 (20.05.2003)

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INTERNATIONAL SEARCH REPORT

International application No.

Information on patent family members

PCT/KR 03/00587-0

Patent document cited in search report			Publication date	Patent family member(s)	Publication date
JP	A2	2102694	16-04-1990	none	
JP	A2	3141994	17-06-1991	none	
JP	A2	10099586	21-04-1998	none	